MISSOURI BOTANICAL GARDEN

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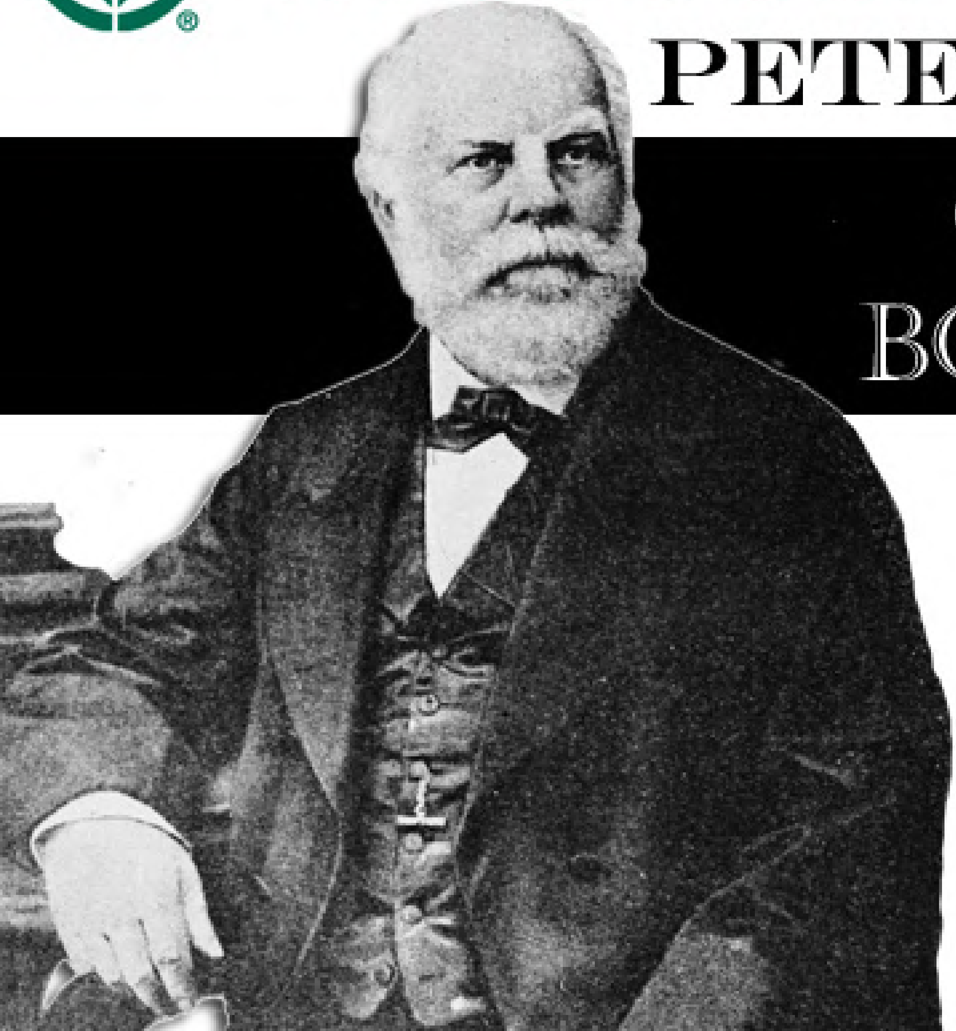

GEORGE ENGELMANN BOTANICAL NOTEBOOKS

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to Bisnoe Salen a variety with 12 radial spines. The large terete, remote tubercles appear to distinguish the species well; and I would add, the short lanceolate groove from the areola upward.

Flowers large, yellow, externally greenish with [illegible] purple tinge in the single specimen before me, 2 3/4 inch long; with a very slender tube; sepals, even the upper ones remarkably obtuse, [illegible]; petals lanceolate, acute, not obtuse and cuspidate as in flexispinus, which has also larger externally purplish flowers, with a much larger ovary etc.

6. E. uncinatus Hopf glauco-viridis vide pag 86

ovatus; costis 13 tuberculatis obliquis; tuberculis compressis sulco transverso distinctis, supra usque ad basin sulcatis, areolis ~~ovato-orbiculatis~~, junioribus albo-lanatis; aculeis radialibus 8 ~~teretibus~~; ~~4~~ inferioribus 3 brevioribus teretibus uncinatis, purpureo-fuscis; lateralibus superioribusque 5 compressis, basi stramineis, supra rubellis, apice fuscis, summis longioribus, latioribusque; centrali complanato ad basin angulato, ~~compresso~~ ~~supra complanato~~, uncinato; ~~stra~~ erecto longissimo flexuoso ~~flavescente~~ stramineo albido apice fuscato; floribus ab areola aculeis ~~spinifera~~ distantibus ex basi ~~tuberculi~~ ortis; sepalis inferioribus 25-30 ~~squamiformibus~~ (ovato-triangulatis acutis) longe auriculatis hyalinis, medis 15-25 ovato-orbiculatis cordatis acutis, purpurascentibus (omnibus margine albido membranaceo ciliatis) superioribus 18-20 angustis ~~lanceolatis~~ oblongis obtusis, purpureis ~~albo-marginatis~~ fuscis; petalis 20-30 lineari-lanceolatis obtusiusculis ~~interioribus~~ mucronatis denticulatis & purpureis; stylo supra stamina numerosissima ~~longe~~ exserto stigmatibus 10 ~~erectis~~ tuberculis ~~adpressis~~, ~~roseis~~ carneis. Bacca ovata seminibus ~~obovatis~~ curvatis, parte ~~superiore~~ ~~subglobosa~~, opaco minute tuberculato dorso carinato; ~~parte~~ inferiore cylindrico laevi lucido; hilo orbiculato (sed 0,8 l. long) and on the River below;

; Near El Paso ~~at~~ also ~~at~~ Eagle-springs, on stony hills, and ~~higher~~ nearly to the top of the mountains; commonly in tufts of grass or hidden among low bushes; × fl. in March and April. — Ovate, 3-6 inches high, 2-3½ in diameter; crowned with a tuft of the long whitish hooked spines. Areolae 8-12 lines distant. In our adult plants there are generally 3, or very rarely 4 lower hooked radial spines, ¾-1¼ inch long; ~~the~~ 5 upper spines are 1-1½ inches long, paler and flattened, and, what is unusual, the uppermost longer broader and paler than the other; sometimes I find 6 upper spines; ~~with~~ the 3 outer and more slender ones appear radial and the 3 inner and stouter spines assume the ~~form~~ position of 3 upper central spines, when the ~~y~~ 10 spines ~~would~~ be arranged as 3 lower and 3 upper radial and 4 central spines. The hooked central spine is 2-4 inches long, not annulated. Young plants have 6 or 7 radial and one central spine, all terete, and dark purplish with darker tips, all from ½ to 1½ inches long; in somewhat older specimens the central spine elongates, and finally becomes flattened and whitish. —

(2 or 3 lines distant from the spines)

flowers 1-1½ inch long, dark purplish red, opening at mid-day in bright sunshine. — E. uncinatus Hopf (from northern Mexico?) is said to have 9-11 spines, of which 4 are central and 5 to 7 radial. The description says nothing about the ~~flatness of~~ the central spine being flat; the flowers are described exactly like those of our plant —

collected also in 1849.

somewhat urceolate"
"filaments at least 1000" ~~yellow~~
~~below~~, "orange at tips"
fruit ovate, 8-12 ~~½ inch~~ l. long, fleshy
seed 0,8 l. long remarkably curved — very different from descr. of another
see descr on last page

A better arrangement of this section might be

1, E. setispinus
2. E. Wrightii
3, E uncinatus
4, E. brevihamatus
5. E longihamatus
6. E. flexispinus

setispinus
Wrightii
longihamatus
flexispinus
brevihamatus
uncinatus

Echinocactus laticostatus, n. sp. —

glaucescens, depresso-globosus, (vetustis ovatis, umbilicatis) costis 8 obtusissimis latissimis inter areolas paulo depressis, ~~sulcis~~ sinubus superficialibus acutis, areolis ~~sub~~ orbiculatis basi truncatis, elevatis, junioribus albo ~~tomentosis~~ lanatis; aculeis ~~6-8~~ robustis compressis, annulatis recurvatis, rubellis demum cinereis, 5-8 radialibus superioribus ~~duobus~~ debilioribus ~~sursum divergentibus~~ (infimo deficiente); centrali singulo robustiori ~~latiore~~ deorsum flexo; floribus centralibus ex areolis densissime lanatis ortis; ovario campanulatis, tuboque dense longeque lanato, sepalis externis 60-70 subulatis et linearibus et lanceolato-linearibus spinoso-aristatis atro purpureo ~~fuscis~~ nudis in axillis ~~dense~~ lanigeris. sepalis interioribus sub 15 obovato-lanceolatis, ~~obtusis~~ mucronatis; petalis 36 oblongo-lanceolatis, obtusis eroso-denticulatis, dilute purpureis; stylo super stamina numerosissima flava exserto rubello, stigmatibus 6-8 brevibus erecto-patulis, bacca purpurea squamosa, ~~lana~~ densa involuta, seminibus subglobosis nigris opacis rugosis minutissime ~~tuberculosis~~ verrucosis; hilo orbiculato.

Stony soil on the point of hills, from the Pecos to El Paso and upwards to Donana. Wright 1849. 1851. & 1852 (No. 218) Brought by Dr Wislizenus 1846 from El Paso and Chihuahua. fl. = April & May (A remarkable and splendid species

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nearly related to E. texensis with which it has in common the flattened recurved annulated spines, the woolly flower, the subulate exterior sepals, and the succulent scarlet berry; easily distinguished by the smaller number of the very broad ribs, the somewhat more slender spikes, the purple flower, and the seeds. —

2–8" high 3–6 in dia

The specimens which I have examined are all depressed, 1½ – 4 inches high and 2½ to 5½ inches in diameter; "old specimens ~~are said to be~~ 6 – 8 inches high, oblong and even cylindrical", Ribs in very young specimens 5; in all flowering ones which I have seen 8, sometimes 10 "below 1½ inches or more wide." V. Areolae 6 – 10 lines distant, covered with thick long wool when young; Spines mostly 6 to 8, rarely 9; ~~almost~~ equal in length, ¾ – 1½ inches, ~~long~~ but mostly 1 inch long. ~~upper spines~~ more + flowers 2½ inches long of almost the same diameter open only in bright sunshine; light purple, tube lighter; Ovary very short (3 l. long) globose, tips of sepals dark purple, naked, sticking out of the dense white wool which covers ~~the greater part of~~ the ~~flower~~ tube. Stamens 1266 in one flower. Berry juicy, but very soon drying up, and finally breaking off transversely leaving the base with most of the seeds ~~remaining~~ ~~enveloped~~ hidden. in the thick wool. Seeds when perfectly ripe copper shrivelled. 1,2 l. in diameter almost globose,

ribs divided by very shallow transverse grooves into something like tubercles.

Echinocactus horizonthalonius Lem. is perhaps too nearly allied to our species; it seems to be distinguished by the absence of a central spine, and by the petals being lanceolate-linear and very acute, pale rose-colour. ~~seeds larger~~ ~~I have~~ the variety β. curvispina Salm. – with a broader lower spine seems to connect both forms.

see pag 222

Cactaceae 30. 1852

Echinocactus flexispinus ? Examination of specimens.

1. Devils River, Wright July 8 1852 10–11 radial, 4 central spines Lower radial ¾–1¼", lateral 1¼–1½" – upper 1¾–2" central 1¾–2, ~~[illegible]~~ hooked one 2" – most spines variegated, purplish with white points, lateral spines whitish – – All spines subterete, none annulated. — 2–3 cylindric glands at base of flower

flower 3½ inch long; ovary with 35–40 scales; 9 l. long 50–60 lower scaly sepals purplish green with membranaceous slightly ciliate margins; somewhat cordate at base; Middle sepals 15 or 20 spathulate, obtuse; also slightly ciliate; about 15 or 20 upper ones oblong obtuse, ~~&~~ often ~~somewhat~~ mucronate ~~cuspidate~~; yellow and greenish purple; Petals 30 oblanceolate, obtusish, cuspidate, acute, erose-denticulate, inner most only lanceolate yellowish with purple tips at midrib outside; – style exserted above stamens but far included in flower; stigmata long linear, spreading 18 or 20; berry over one inch long with 35 or 40 scales; seed obovate-globose, shining, very minutely pitted (in that respect similar to E. Wrightii, but much larger, 0,8 l. long; hilum narrowly oblong

2, Specimen in fruit; similar spines all terete; shorter central only 1½–2" all more or less purple, points always whitish

3. Hills of San Pedro River 1849, July 13–14 radial 5 upper 1 lower central, Lower radial 1–1½" lateral about 2" upper 1¾–2¼" – Upper central spines 2¼–2½ lower central 3¼–3¾ –

flower 3¼" long, 40 lower, 10–12 middle, 15 upper sepals; petals obtuse, erose denticulate mucronate young fruit 1¼" long, oval, with 25 or 30 scales seed very unripe

Only young spines purplish, especially the ~~upper~~ central and lower radial ones – older spines gray; stout spines indistinctly annulated, lower central and one or 2 of the others are angular compressed

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4. № 538 Limpio to San Felipe Jun.

11–14 radial 3 : 1 central; all central spines angular

lower ~~central~~ radial 1¼–2", lateral 2¼–2½" upper 1¾–2¾"

Upper central 2¼–3" lower hooked central 3½–4"

— flower 2¾" long, very similar to the last (№ 3)

5. Dr Bigelow's specimen July, on the Limpio

radial 11–14 central 3 : 1

most all spines annulated; all the stouter ones angular, but mostly the central spines — Lowest spines 1¾–3." lateral 3½" upper 2¾–3¼" — Upper Central 5" — Lower central 6½

A small specimen (young plant?) has spines only ¾" to 2" long!

flower 2¾" long, ovary with 20 scales; in all about 35 lower 12 middle and 12–15 upper sepals and 25 petals — purplish outside, obtuse, retuse, and mostly mucronate

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see page 110: Varieties of E. flexispinus

α. crassispinus aculeis radialibus robustissimis 8–11, centralibus 4 angulatis, infimo elongato flexuoso plus minus hamato, ~~robustissimis~~

16– β. gracilispinus aculeis gracilioribus ~~radialibus~~ 16–20, ~~rad.~~ exterioribus 12–14, centralibus 4–8 plus minus angulatis infimo elongato-hamato

δ [illegible] see pag 120 γ. ~~t~~ brevispinus aculeis radialibus gracilioribus 8–11, centralibus 4, teretibus, cum infimo hamato radiales vix superantibus

see page 110 δ Lowest spine shortest and stout often recurved; upper spines longer and the most slender, lateral longest, central spines stouter and mostly longer. + The ~~different~~ forms characterized above differ very much at first sight but it appears impossible to specifically

+ with the exception of the stoutish lateral spines they are all more or less purplish or variegated when young, with paler points, and ashy gray when old

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draw distinct lines between them; ~~appears to~~
distinguish them. (~~and they seem to run into~~
~~E. longihamatus~~) — I var α. lower × upper radial spines 1–1½
lateral, 1½–3; upper central 2½–4 and lower
4–5 inches long; ~~the latter~~ and twice as ~~thick~~ stout
as in the next form; × Var β has longer
but more slender spines; lower and upper radial
spines 1–3½, lateral 2–3½, upper
central 2 to 5, lower central 3–6½ inches long;

× often in southern forms fewer spines, northern more numerous

Var γ ~~is probably the form of the~~
young plant. ~~but~~ ~~it~~ ~~as~~ we find these
Echinocacti already flowering when very young, and
long before the characters of the mature
plant are fully developed; this is
also especially the case with E. Wislizeni which
very often flowers while ~~the central spine is~~ quite small spines
yet short and terete; ~~as~~ though I must remark the forms brought from 185? have already the flattened central; lower radial spines ½–1¼ inch
upper spines 1½–2, lateral ones 1¼–1½; ~~upper~~
central spines all 1½–2 inches long.
The flowers of this form, now before me
are the largest of all. ‡ Var δ? see pag 120. ‡

Flowers 2½–3½ inches long, (~~in~~ δ)
yellow, purplish externally ~~at the~~ especially
the points and midribs of the sepals & petals. × Between the flowers and spines 2–5 cylindric glands — which when young exude a viscous clear fluid; — ~~they become~~ are persistent & ligneous ~~[illegible]~~ — the same as observed in all species of this section
Seeds 0,8 l. long, almost globose with a narrowly oblong
hilum; ~~[illegible]~~

E. flexispinus Salm is a very different plant,
with 30 ribs etc. —

This may be the same as Galeotti's perhaps not differ from
E. longihamatus from Mexico (what part?)
which is described as having 9 radial and
4 central sp. – the hooked spine 4–5 inches long;
the description of the flower agrees
pretty well with our species. E. hamatocanthus
Mühlenpf. is according to Prince Salm (a variety with
12 radial spines. —
flexispinus Salm Cact — see pag 110

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E. flexispinus δ? leucacanthus

aculeis radialibus 12-15 gracilioribus setaceis, lateralibus compressis; centrali inferiore longissimo complanato, canaliculato-ve; floribus virescenti-flavis, petalis lanceolatis acutis.

Var? δ may be a distinct species, but ~~the~~ means at present at my disposal, make it impossible for me to ~~satisfy~~ satisfy myself abt it ~~me give a satisfactory det~~ ~~The radial spines are more slender~~ ~~the areolae appear orbicular~~. The tubercles of the ribs are apparently less prominent the areolae orbicular, the radial spines (1-2 inches long) more slender, purplish, the lateral ones whitish, compressed, the 3 upper central ~~similar to the upper~~ purplish, somewhat annulate & angular the 2-2½ inches lower central ~~compressed~~ about 4 inches long, pale straw coloured afterwards ~~only~~ grayish or whitish, flat or at least channelled; while in flexispin proper they are in the fully developed specimens + always I believe carinate above. ~~flowers somewhat~~ + about the same size apparently with narrower tube ~~smaller~~, ~~with flowers~~ sepals flowers apparently greenish yellow; petals lanceolate acute, (not obtuse mucronate). The flower with part of a rib & spines attached was coll by Mr Wright in the same region in 1849 (No. 223. b), and ~~among~~ the living plants brought 1852 there is one ~~which appears evidently~~ belongs here.

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this may be E. sinuatus see ~~p. 106~~
pag 227

XXVII

§. 4 Intertexti.

19. E. intertextus E in B.C.R. √ minor ovato-globosus, costis 13 acutis × interruptis, tuberculis ~~supra~~ sulcatis; aculeis rigidis × rubellis ~~ad~~ apice fuscatis, radialibus 16-25 arcte adpressis, superioribus 5-9 tenuioribus sub-fasciculatis, infimo robusto brevi; centralibus 4 superioribus 3 ~~cum~~ radialibus es superior~~ibus~~es ~~implicatis~~ excedentibus × cum iis implicatis, inferiore singulo abbreviato porrecto; floribus parvis in vertice dense lanato congestis, ~~pallide~~ roseis, bacca sicca vix squamata, seminibus scaphoideis.

β. dasyacanthus E. l.c. major, ovatus, aculeis setaceis ~~tenuioribus~~ longioribus purpureo-caesiis √ radialibus patulis, centrali ~~singulo~~ inferiore ceteris paulo breviore ..

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Cactaceae 31 Nov 1852 121

Echinocactus Wislizeni — from El Paso to Donana, mostly in valleys; — not eastward; found also in North Sonora (on the Gila, Emory)

Seeds obovate, obliqu., 1,0 to 1,2 l. long hilum small, almost circular; seed black, shining ~~with~~ minutely ~~dotted~~ rather pitted. Under a strong glass these dots are (more or less) circular grooves, leaving the centre as high as the ~~general~~ surface of the seed.

Ovary with 80–90 scales

One specim. 8 inches diamet. has 13 ribs below, and 21 (new ribs ~~sp~~ originating in the intervals) on top — larger specimens mostly with 20 ribs

Areolae from 6–18 l. distant, nearer together in old plants

upper central spines 1¼ – 2½, lower hooked spine 2 – 3½ inches long, sometimes twisted; ~~lower~~

3 lower radial spines annulated, shorter 8–20 l. long,

3 upper annulated spines, somewhat weaker than the lower 1½ – 2 inches long, may also be considered as upper or adventitious central spines in younger specimens they are wanting. —

lateral setaceous spines 15–20 1½ – 2¼ inch long spreading horizontally and ~~both~~ laterally — somewhat twisted

All the annulated spines are red~~dish~~, with paler points

the setaceous spines are yellowish ~~whitish~~

Dr LeConte has collected seeds of an Echin. ~~on~~ the Gila named by him E. Wislizeni the seeds only 0,8 l. long pitted, curved hilum small, circular. scarcely albumen embryo hooked — an unknown species. E. LeContei no doubt with hooked spines (the same as Emory's from the upper Gila River? which I named E. Wislizeni)

Echinocactus dasyacanthus

costis 13 acutis ~~tuberculatis~~, interruptis, plerumque obliquis; tuberculis supra tomentoso-sulcatis, areolis ovatis junioribus albo tomentosis, approximatis

aculeis radialibus ~~sub 19~~ [19–23] c purpurascente rubris plurisserialibus setaceis, flexilibus laxe patentis, ~~laxe~~ superioribus 7–9 ~~tenuioribus~~, ~~tenerioribus~~que, albidis; ~~lateralibus longioribus, inferioribus brevioribus robustioribus~~ reliquis subaequalibus centralibus 4 ~~vix robustioribus~~ 3 superioribus sursum ~~rectis~~ versis reliquos excedentibus ~~longioribus~~, inferiori singulo porrecto paulo breviore; ~~e lana densa prominentibus~~ floribus minoribus ~~in~~ vertice dense lanato congestis; ovario brevissimo | this to E. intertextus | 5–6 squamato, sepalis 20 late ovatis, cuspidatis albo marginatis, petalis 20–25 oblongis mucronatis,

Can ~~this~~ be E. Scheerii P. Salm, described from very ~~bad~~ specimens, 1 p. 155 — 13 tubercled ribs 20 slender radial, 1 stronger hooked central spine?

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this belongs to E. intertextus

(purpurascentibus) stylo stamina numerosissima vix superante; stigmatibus 7–8 purpurascentibus, erectis] bacca globosa, sicca, squamis evanescentibus subnuda, basi subpersistente, ~~irregulariter~~ circumscissa; seminibus ovato-reniformibus levissime verruculoso-asperis, subopacis

hilo ~~magno~~ obvoluto

„On stony ridges about El Paso coll. 1851 & 1852; fl. mostly in March". Simple, ovate, 1 to 6 inches high, 1½–3' in diameter;+ areolae 3 lines distant; spines× all light purplish gray, principally towards the tip; upper radial spines lighter, ~~those weak~~, 6–7 l. long; lateral and lower spines 7–8 l. long, lowest stouter, hardly shorter; 3 or rarely 4 upper central spines directed upwards, 9–11 l. ~~long~~ and lower central spine 3–5 l. long. — Flowers+ about one inch long, sepals # dark purple with paler margins, petals similar, outer ones ~~deeper~~, inner ones ~~paler gradually~~ lighter coloured; stamens more than 650; yellow ~~half as long as~~ petals.# ~~Fruit~~ Fruit dry, globose, about 4 l. in diameter, topped by the withered flowers; almost circumscissile, and base mostly remaining sessile for a long time, while the upper part (separating more or less regularly) comes off. ‡ Seeds 0.9 l. long, reniform or rather naviculate, curved around the large hilum, almost opaque, showing only on the smooth margin of the hilum; albumen small, embryo curved, cotyledons short. ‡ see below — The appearance of this plant is much more that of a Cereus than an Echinocactus, and

+ flowering when only 1 or 2 inches high

× ~~loosely~~ half-spreading ~~mostly~~ obliquely #

coloured

this belongs to the next

+ opening in the middle of the day, in bright sunshine.

flower is said to be very much like that of the next species

(description of flower after Wright's notes — none seen.)

‡ Hyaline scales of the fruit transversely ovate, obtuse, hardly ~~somewhat~~ ovate to the base, denticulate-ciliate easily rubbing off. In some specimens I find in their axils loose wool which in others is entirely wanting — an approach to the densely woolly axillae of the ~~spatulate~~ scales of the fruit of E. texensis!

it considerably resembles E. dasyacanthus so much so that I have given it the same name; the spines however are longer and weaker etc. —

‡ see last page: In young plants the radial spines about 15 more spreading, the lower central spine and often one or 2 of the upper ones wanting

Echinocactus intertextus ovato-globoso-ovatus costis 13 acutis interruptis, subobliquis, tuberculis supra tomentoso-sulcatis; areolis ovatis (in plantis junioribus angustioribus) ~~[illegible]~~ approximatis aculeis plerisque rigidis e basi albida rubellis apice fuscatis, radialibus 16-25 arcte ~~radiantibus~~ ~~recurvatis etc~~ arcte adpressis (superioribus 5-9 rectis setaceis, subfasciculatis, albidis, lateralibus rigidioribus, paulo longioribus, infimo robusto breviore ‡, saepe paulo recurvatis) centralibus 4; 3 ~~longioribus~~ superioribus radiales ~~superantibus~~ excedentibus, sursum rectis, inferiore singulo porrecto brevissimo; floribus minoribus in vertice dense lanato congestis, ~~sepalis~~ ut supra bacca ~~seminibusque~~ ut supra.

Chihuahua, Dr Wislizenus 1846, El Paso Mr Wright 1851 & 52. (No 86). — fl. March & April. Stem 1-4 inches high, and a little less in diameter; areolae 3-4 l. distant; spines pale at base, reddish or rose coloured, with darker points, with the exception of the upper setaceous spines which are paler; these are 2½-6 l. long, the lateral spines are 4-7 l. long, lowest only 2-4 lines; ~~long~~; upper central spines 5-7 and even 9 l. long lower one only about 1 l. long; in young plants ~~the upper~~ radiating spines are more equal 13-15 in number and several or all of the central spines wanting

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Flower — see p. 122.

fruit and seed can not be distinguished from that of the foregoing species. I have seen none ~~though~~ however with woolly axillae of the lowest sepals ~~ovary scales~~. Though at first sight ~~they appear to be more distinct~~ both these species appear so very dissimilar, they nevertheless are very closely ~~related~~ so that even intermediate ~~[illegible]~~ forms connecting them may yet be discovered. As at present advised ~~the former is readily distinguished by the distinct~~ from E. intertextus is readily distinguished from the ~~relative~~ foregoing species by the shorter, stouter ~~[illegible]~~ appressed and oft curved spines, and the more globose shape; the arrangement of the ribs, the tomentose grooves on the upper part of the tubercles are the same in both, and so is fruit and seed. — ~~In Poselger~~

~~In Poselger Salmi's Catalogue (1850) pag 155. E. Scheerii is mentioned: young plants raised from seeds which [illegible]~~

Mr Wright has ~~found~~ collected both in 1851 and 1852 on the „mountain pass of the Limpio" a singularly similar plant, which he notes as having the small fruit low on the plant!" — "x Unfortunately neither fruit nor flower was gathered, which alone could satisfactorily decide the question. ~~which~~ The living specimens before me have 2–4 inches high, 13 ribs tuberculated and every way like those of E. intertextus; 14–19 radial spines, 3–6 lines long; 3 upper central 6–8 l. lower central spine 2–3 in one instance even 5 l. long; young plants have about 12 almost equal radial (2–3 l. long) and no central spines. If this after further examination really should prove to be a Cereus it will have to bear the same name C. intertextus.

x this would indicate a Cereus

areola 3 lin distant rather orbicular.

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1853

Echinocactus unguispinus E. in Wisl. Rep. Note 48 ~~a larger stouter plant with~~ collected near Pelayo between Chih. & Parras; is a very nearly related form, though it is larger & stouter has 21 ribs, and ~~stouter~~, 25–27 stouter, recurved spines (~~1–1½ inches~~ long). The tuberculated ribs have the same linear tomentose groove on the upper side of each tubercle ~~and~~; the ~~arrangement~~ of ~~the~~ numerous spines is also similar. ~~and~~ The fruit and seed described by me I have since ascertained to belong to E. uncinatus. —

Echinocacti

I. Polyacanthi costae 13–21, tuberculatae, tuberculis supra sulcatis v aculeis numerosis, (plus quam 20–30) summi setacei, infimi robustiores breviores. acul. centrales superiores elongati, ~~inferiores breviore robustiore~~; flores minores purpurei; bacca sicca subcircumscisse dehiscens. sepala exteriora reniformi membranacea

(E. unguispinus is classed with the next group by Prince Salm

1&2 = § 6. Microgoni Pr. Salm

1. E. dasyacanthus
2. E. intertextus
3. E. unguispinus

II Hamati costae 13 ~~tuberculatae~~, aculei numerosi (12–20), laterales longiores debiliores infimus brevior robustior, centrales ~~plerumque~~ 4 inferior elongatus hamatus, plerumque applanatus. flores infra tubulosi, magni, flavi; bacca carnosa ~~coccinea~~ sepala exteriora reniformia s. cordata, membranacea

(§3. Uncinati xx. Hamati Salm

a. Genuini

4. setispinus
5. Wrightii
6. flexispinus
7. brevihamatus
8. uncinatus

~~B~~. Maximi Costae 21 continuae ~~subaequales~~ aculei numerosi (20–30) difformes, laterales longiores setacei, inferiores breviores robustiores, centrales plures recti, inferior robustissimus hamatus; flores majusculi flavi; sepala exteriora uniformia; bacca ~~lignea d~~ sicca dura!

9. E. Wislizeni

(10 E. LeContei ?)

III. Cornigeri Costae 8–21 aculei pauciores (6–13) subaequales, plus minus compressi, annulati, curvati, infimus ~~nullus~~ deficiens, centrales 1–4, inferior (s singulus) recurvatus deflexus; flores rosei s. purpurei, majores; sepala exteriora subulata, in axillis lanigera, bacca miniata succosa (§. 3. Uncinati × cornigeri Salm.

11. E. texensis.

12 E. laticostatus.

13 E. albispinus.

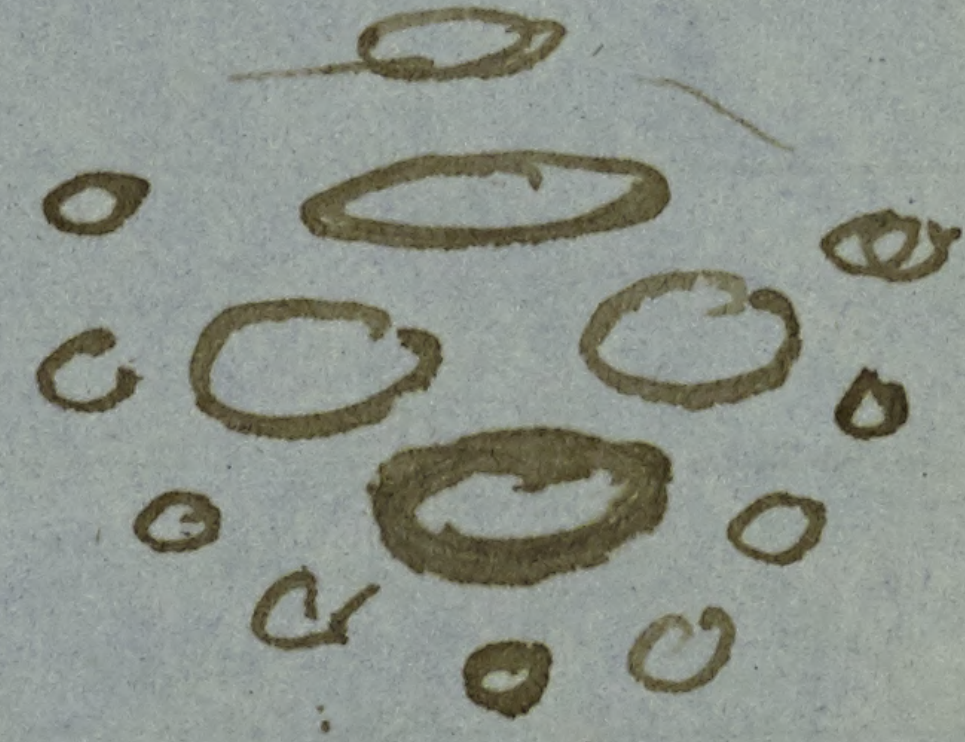
~~14. E.~~

galeott. Pr Salm pag 173

Echinocactus bicolor (obtusis sinubus acutis (?)

globosus Costis 8 tuberculatis, obliquis, areolis orbiculatis; aculeis ~~radialibus~~ ~~rubellis~~ hinc recurvatis rubellis variegatis ~~basi bulbosis~~ basi bulbosis, radialibus 9–13 lateralibus inferioribusque teretibus ~~rectis s. flex~~ si adest ~~spinis recurvatis~~, summo compresso dilatato, chartaceo ~~flexibili~~, ~~longiore~~; centralibus 4 paullo ~~curvatis~~ valde divergentibus, ~~summo superiore applanato~~, ~~planis~~ ~~...~~ summo latissimo ~~erecto~~ sursum verso, 2 lateralibus minus compressis, ~~summo latissimo~~ ~~albido~~ ~~3 superioribus obliquè sursum versis~~ albidis rubellis sursum divergentibus ~~recurvatis~~, inferiore ~~deflexo~~ longiore saepius subhamato, ~~rubellis~~ ceteris rubello deflexo

Chihuahua Dr Wislizenus. Specimen before me 3 ~~inches~~ in diameter, lateral spines 6–8 lower spines 4–6 lines long, upper flat central spine, flexible, ~~about~~ 1 inch long 1 l. broad lower central spine a little longer, not quite as wide and 2 upper oblique central spines a little shorter. Sometimes an additional flat spine is found above (or behind) the first, but always weaker and shorter. No flowers or fruit seen.



This seems to be E. bicolor β. Pottsii ~~p~~ see pag 223

A specimen has been sent to me by Prof Gray in the year 1850 as coming from the New Mexican Collection of Wright (1849), which has never been again collected 1851 and 1852. I suspect it rests on a mistake and is an Echinopsis from South America, mixed by mistake among Wrights collections.

Globosus, costis 13 acutis, compressis, sinubus profundis areolis magnis hemisphaericis aculeis rectis tenuibus rigidis radialibus 8–10, centrali singulo s. 3–6 radiales vix excedentibus.

Plant 2½ inch diameter, spines 6–12 l. long; on the ~~older part~~ of the plant ~~shorter~~, weaker, but more numerous. Probably Echinopsis oxygona or perhaps E. multiplex

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see page 178

Grahami nob. ~~Schelhasii Pfeiff.~~

Mamillaria ~~Grahami~~

n. 37

sub ~~simplex~~ globosa s. ovata; tuberculis confertis cylindricis paulo compressis; axillis nudis; aculeis radialibus sub-25 setiformibus, rectis albis, apice plerumque fuscatis, uno alterove superiore robustiore, longiore ~~fuscato~~; centrali singulo robustiore, longiore & hamato sursum porrecto ~~fusco~~ atro;

areolis orbiculatis

Eastern slopes of the Mountains about El Paso and southward. — Specimens all dead and without flower and fruit 1–3 inches high, 1–2½ in diameter; tubercles ~~3 of~~ 4 l. long, subcylindric, at base somewhat dilated; ~~radial spines in smaller specimens of as much as 28 and 30~~ ~~and very slightly li.~~ ~~in larger ones they are 23–25, in the form~~ mostly in 21 spiral rows. Radial spines like slender bristles, in smaller specimens 25–30 often entirely white, 2–4 l. long, without any stouter ones. In the largest specimens they number 23–25 ~~[illegible]~~ 5–6 l. long; 1 or 2 are stouter and darker ~~spines~~ ~~ones 5–6 l. long; stouter spines~~ and directed upwards, 6–8 l. long. — The central spine ~~is~~ always longer than the others, 3–9 l. long with a short or a wide hook; the ~~hook~~ point being curved upwards while in the hooked Echinocacti and also in M. barbata it is always curved backward or downward. ~~Pfr.~~

‡ This species ~~is~~ ‡ It is nearly related ~~with~~ to globose Mamillaria barbata E. from the Mountains of Chihuahua, but that has over 50 radial spines, ~~with the~~ in several series, outer hairlike white and the inner stouter ~~bristle-like~~ brown ~~series~~, the hook of the central spine is curved downward.

‡ Is perhaps too near M. Schelhasii Pfr. from Mexico, but this is described as a much larger globose plant 3–5 inches high, tubercles 6–10 l. long, radial spines 15–20 (axillae woolly)

+ note fl. of M. barbata p. 84

(Mr Wright has ~~[illegible]~~ observed near the Copper mines, northwest of El Paso a very similar Mamillaria, with only 12 radial white spines, the lower ones with brown tips

4–5 l. long, and 2 brown central hooked spines of the same length. ~~It~~ may be named ~~M.~~

M. diancistra, simplex, depresso-globosa, tuberculis cylindricis, areolis novellis albo-tomentosis, aculeis omnibus aequilongis ~~radialibus~~ sub 12 setaceis, albis, superioribus apice ~~sub fuscatis~~ obscurioribus; centralibus robustioribus, ~~sub~~binis divergentibus, uncinatis, fuscis basi pallidioribus, bacca (viridi) oblonga floris rudimento coronata.

Near the Coppermines Northwest of El Paso. Only specimen seen in fruit was leveltopped, 1 1/2 inches in diameter; tubercles 6 l. long, spines of nearly equal length, 4–5 l. long. — M. zephyranthoides Scheidw. from Oaxaca is the only other species of this section with 2 hooked central spines; it is also leveltopped and has 12–14 radial spines of the same length as the (sometimes 4) central spines; but plant much larger, tubercles 9–16 l. long, spines 5–10 l. long. — These three Mammillariae belong to the Section Crinitae; but none of them have pubescent spines, as many Crinitae have.

2. M. barbata as well as Grahami ~~have~~ the central spines are ~~much~~ longer than the radial ones, but in diancistra they are of equal ~~ll~~ length. The stouter darker upper radial spines which I found in M. Grahami, occur in several other species and are described as upper spreading central spines; in M. barbata however these spines ~~from the inner~~ number 10–15 and spread all round, forming ~~an inner~~

Mamillaria Echinus nsp. globosa (simplex), vertice tomentoso, tuberculis ~~teretis~~ conicis ~~junioribus~~ supra ~~[illegible]~~ sulcatis, axillis villosis, areolis orbiculatis, aculeis rectis s. paulo curvatis ~~radialibus 20–30~~ cinereo-albidis apice pallide fuscatis; exterioribus ~~radialibus~~ 20–30, ~~patentibus~~ radiantibus, interioribus 3–4 robustioribus e basi incrassata subulatis, 2–3 superioribus sursum versis adpressis, centrali validissimo porrecto, (lutei?) floribus in vertice tomentoso centralibus, sepalis sub 20 linearilanceolatis ~~acutis~~ mucronatis integris, ~~petalisque~~ sub 20 longioribus linearibus (fimbriatis?) ~~integris~~; stylo stamina longe superante, stigmatibus 12; baccis oblongis viridibus ~~perigonio~~ centralibus

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floris rudimento coronatis; seminibus ovato lanceolatis laevibus, lucidis fuscis.

On gently slopes of the Limestone hills, on the Pecos and Ojo de Leon on gentle sl. coll 1849. 51. & 52. – A very pretty and well characterized species related on one hand with M. calcarata, and on the other ~~with~~ still more with M. radiosa, but always simple ~~as far as known~~; * ~~Well~~ The numerous whitish slender but very stiff radial spines are laterally compressed at base densely interwoven and ~~closely~~ adpressed the lower 5, the lateral 4 and ~~the~~ ~~upper~~ 6–8 l. long while the single central spine ~~6–7 l. long~~ stands straight out, giving the globose plant a very peculiar aspect ~~This~~ resembling somewhat a sea urchin, Echinus whence the name ⊙ which ~~this central~~ spine is stouter at base and ~~more regularly~~ subulate and 6–7 l. long than ~~that~~ of any other of our species. ~~Flowers were seen in 1849 but not~~ On the specimens coll in July 1849 ~~flow~~ dead flowers and fruit are found; the former are 1 1/2 or perhaps 2 ~~over an~~ inch long, and show smooth margins of the sepals and petals (different from the ciliate sepals of M. radosa etc) the fruit is ~~about~~ over 1/2 inch long, the seed hardly 0,9 l. long, and very narrow, testa pergamentaceous.

* The specimens before me are 1 1/2 – 2 inches in diameter; tubercles in 13 rows, 5–6 lines long; the groove on the upper side ~~of the younger tubercles very indistinct, and often obliterated~~; ⊙ tomentose when young

The 2–3 upper inner spines ~~are closely adpressed and resemble the in direction the radial and in~~ may be taken for inner radial spines with as much justice as ~~the~~ central ones; they are closely adpressed to the radial ones, forming ~~an~~ inner series but are stouter and longer

See next page

see pag 212

Mamillaria pectinata simplex, globosa, ~~vertice parce tomentoso~~, tuberculis e basi quadrangulata conicis abbreviatis, ~~junioribus~~ ~~laxiter~~ ~~sulcatis~~ ~~supra~~, sulco mox evanescente notatis, axillis ~~laxis~~ nudis, areolis oblongis, ~~junioribus~~ aculeis rigidis e basi bulbosa, lateraliter compressa recurvatis, omnibus radiantibus, ~~albo~~ luteolo ~~cinereo~~ albidis et apice dense cinereis subfuscatis; ~~floribus~~ baccis ~~que~~ viridi tomentoso centralibus ~~tomentosis~~ floris rudimento coronatis. seminibus fusco-atris, ovato lanceolatis laevibus lucidis.

summis floriferis ~~teretibus~~ sulcatis villosulis longioribus ~~laevis~~ ∨

sub 20 (16–24) plerumque ~~subaequalibus~~

paullo

4/ In the same localities as the former, especially abundant on the hills near Ojo de Leon. — Near the latter, but much more nearly allied with M. compacta from the Mts of Chihuahua, distinguished from it by its smaller size, greater number of spines, angular and hardly sulcate tubercles etc. — Specimens before me (collected 1849. 51 & 52) 1–1 2/3 inches in diameter; tubercles in 13 rows, ~~2~~ 3 l. long and somewhat wider at base younger ones often with a very slightly ~~tomentose~~ villous groove half way down from the upper angle, ~~which disappears when they get older~~. The whitish very stiff spines 3–4 1/2 l. long, together with the elongated areolae somewhat resemble those of Cereus pectinatus, whence the specific name. The fruit is about 6 l long, the seed nearly 1 l. long, resembling that of the last species, but a little larger and darker. — Var β. was coll 1859 on the San Pedro River. Lower tubercles very much like those of the ~~[illegible]~~ form, but the upper tubercles are elongated, 5–6‴ long, spines unequal, lower 6, upper 6–9 l. long +. Both these Mamillariae are evidently very nearly related to M. cornifera DC & ~~M~~ radians DC. —

~~From~~ the description M. cornifera DC must be ~~very~~ nearly related to M. Echinus, it has the same strongly subulate central spine, but this and the upper two, which are very conspicuous and ~~suggested~~ the specific name ~~for the species~~, are horncoloured, and the tubercles are very thick, wider at base than long etc. —

~~M. pectinata~~ M. radians DC. is a ~~much~~ every way larger plant than M. pectinata, 3–5 inches high; tubercles 3–8 l. long, wider at base, spines 5–6 l long — It is certainly a very unscientific method to distinguish species by measurement, nevertheless in these plants ~~were~~ ~~complete~~ descriptions are often so incomplete, the dimensions of parts sometimes furnish valuable data. At all events M. radians, M. compacta and M. pectinata are very nearly related species.

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+) β. ~~cornuta~~ polya tuberculis cylindricis aculeis radialibus 18–24 ~~longioribus~~ summis longioribus, interioribus 2–3 robustioribus sursum versis, ~~[illegible] rectis~~ radiantibus upper ones more crowded; 2 or 3 inner spines, similar ~~to the~~ the upper radial ones and of equal length make their appearance and are directed upward, and closely adpressed. This arrangement of the spines resembles very much M. radiosa and its nearest relations; but the slightly curved spines are never found with them nor the oblong areolae; flowers & fruit would no doubt also easily distinguish this form; from M. Echinus to which it closely approaches this form is easily distinguished by the absence of the stout erect central spi

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Exam. of specimens of Mam. radiosa and the related species.

1. Largest plant from El Paso, in culti in 1852, coll. 1851 single — ovate-globose, 2½″ high, tubercl. lax in 13 rows, larger, older ones 9‴ long sulcate, about 3/4 down to the base, sometimes less. — Younger tuberc. 6‴ long, sulcate about ⅓ and youngest ones without a groove! axillae naked; 18 radial spines white, with yellowish tip, some very thin bristly spines above and one or two also at lowest end; 4 to 5‴ long 4–5 stouter central spines, reddish brown (rufus) 3–4 upward, ~~but~~ not ~~depressed~~, and one deflexed — all straight 6–7‴ long; upper younger ~~tubercles~~ with 20 rad sp 3–4‴ long, about 4 central 4–4½‴ long at base white above reddish —

2. simple 1851, (second stem died) over 3″ high, but tubercles only 6‴ long lax, sulcate only on the upper ⅔ and often very slightly 20 rad 5 centr, all 4–5‴ long everyway similar to No 1.

3. 1851 two stems from one base; 1½″ high, oval; tuberc 13 rows 4 l. long slightly sulcate in the upper ½ or ⅓; groove often indistinct 30–35 radial sp bristly; (at upper end some quite fine ones,) 3–4‴ long; 6–8 central sp. in all direction loosely spreading thickened ~~bulbous~~ at base; not one more prominent than the others; all spines whitish or some ~~that~~ yellowish tipped. Younger tubercles with 35 very thin hairlike bristles, 2½–3½‴ long, of which the 5–8 innermost are a little stouter than the rest.

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4 single specimen 1851, simple, 1 inch diam 1½ high; tubercles in 13 rows slightly sulcate at the upper ⅓ or ¼; 3½‴ long 20–24 rad. spines thin bristly uppermost hairlike, 3‴ long, 2–3 upper and 1 lower central; this is the only one which is at the upper half reddish brown, all the others are white — it is stouter, deflexed, conspicuous; all central sp. a little longer than the others.

5. – single, 1851 (the central plant in pot No 11, which contains all the above 2″ high 1″ diameter; tuberc 13 rows often hardly sulcate, or only on tip — Larger lower tuberc 4½‴ long, upper only 3–3½‴, 20:21 radial 3–3¾‴ long, 3+1 central, all white except in the younger ~~tubercles~~, where the upper half of the lower central sp is yellowish brown.

6. (Pot No 4. 1851 supposed to be M. tuberculosa — small spec. oval 1″ high) tuberc (which in all forms are more cylindric) are oval, 2‴ long 1½ in diameter, grooved to the base, or axill, which in young. tuberc is ~~somewhat~~ woolly (as is always the lowest end of the groove) Spines radial more rigid than in all forms! 16–19, 2–2½‴ long central 1–3 3–4‴ long stouter, reddish at the end,

0 1 2 3 4 5 6 7 8 9 10
cm
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MISSOURI BOTANICAL GARDEN

3–6‴ white or dark tipped, only the 2 lateral spines are reddish brown with black at end! — longest upward. — Fruit oval 9‴ long 6‴ in diameter, without the remains of flower; green, very juicy; seed obovate or almost [illegible], compressed yellowish brown (fulvous) scrobiculate, almost 0.8‴ long or 0.7¾‴

28 Live pl. 1852 small globose, simple; tub. slightly sulcate, axilla naked; 23–26 rad. sp. 2 central

29. Large live specim. 1852 cylindrical branched from base; 5″ high 1½ diam. tubercles in 13 rows deeply sulcate, somewhat erect, round, slightly compressed, 3‴ long, rhombic at base, axills very woolly. — 28–30 rad. sp. 2½–3½‴, lower as in most of these species stouter, not as crowded, and rather short; upper thinner, gracilior, a little longer with very short & slender ones mixed, crowded towards the upper margin of the areola. — Central 6–8, 3–7‴ upper slender, 3–4; 4 lower stouter, longest directed upwards, darkest, 2 laterally upwards shorter, 1 downwards shorter stouter. only the larger inner spines with purplish tips, the longest upwards grayish purple. Dead flowers

30. Live spec. 1852 conic, 2¾″ high 1½ diameter, tubercles as above in 29. older ones broadly rhombic at base, much appressed in 13 rows; deeply sulcate, axills lanate 25–26 rad. sp weak, white 2–4‴ uppermost weakest, shortest & longest 9 inner spines, especially the larger ones the greater part black. 5 upper and outer weaker, paler, 6–7‴; 4 inner and lower stouter, 3 upwards 6–8‴; lower porrect, (straight) 6‴ long (appearance much like M. conoidea

31. Dead pl. 1851 simple ovate 1½″ high; tub 2½‴ 25–28 rad sp. 2–4‴ long 8–9 central sp 4–9‴ shorter stouter, below, weaker uppermost, longest also upward (see 29) colour of rad white of central rose colour, or rather grayish purple with dark black purple toward tip. dry fruit oval 3 l. long, remains of fl. same length, seed brown, very small globose-obovate, 0.4‴ long! lower tubercles destitute of spines in 21 upper 13 rows

"Rocks at Eagle spring, simple or commonly very proliferous"

32. Dead pl. 1851 3″ high 1½ diam. 4 globose branches at base; the latter with fruit, exactly like 31. 26 radial 8–9 central 4–6‴ sp. in every respect like 31; central spines all spreading, especially in older tubercles, which are 3–3½‴ long. Young spines on top of plant rather most all directed upwards, which gives the plant

138 a crested appearance — This crest is bluish purple or grayish-purple, quite peculiar; the central spines on the lower older tubercles loose this purple tinge and are gray — and radially spreading, so that they are not so conspicuous.

Mam Santa Fe, Fendler. tuberc 6''', 16 rad sp 4–7''' stout 4 central, 7–8''' 3 upper weaker, 1 erect or deflexed stout, longest, all 4 purple from base, — Another tub. 4''', 26 rad sp 3–6''', centr 3–4 5–6''' purplish, — Seed reddish or rather yellowish brown 0,8''' compr.

Mam Erilijens tuberc 4''', 12–13 rad sp 3–6''' with dark tips; 6 central 5–7''' purple at base, & tips variegated with white ax. entirely purple. — Another 16–17 rad sp. dark tips 2–6''' long 5–6 central, pale purple at base, dark tips, variegated 6–7½''' tubercles sulcate, tomentose groove when young [12 Fendler 2–4
14–16 1847 3–4]

Mam vivipara Missouri 1852. rad. sp white 16–17 central 3 upward, 1 downward, purple from base, upward darker at tip — Tubercl 3–3½''' very little sulcate

Mam. radiosa Texas tubercles subterete, slightly & partly sulcate. axills naked — 20–30 rad. spines 4–5 central, one of which is turned downward

Arrangement of the Mam. ~~vivipara similes~~ arachnoideae.

M. conoidea DC tub. sulc, ax. subnud. Ac. rad 12–16 cent. 1–5
M. sphacelata Mart. ax. subnud A. rad 12–18 cent 1–2 (rarius 3–4)
M. vivipara Haw tub subsulc ax nud. A. rad 12–16 cent 3–4
M. strobiliformis Scheer subsulc ax subnud. A. rad 20–25 cent 3–4
M. radiosa Engelm tub subsulc ax nud, A. rad. 20–30 cent. 4–5
borealis Fendl. Wisl. " " A. rad. 12–20. cent. 4–6 variegat
novomexicana " " " 20–30: cent. 3–6
~~Pottsii~~ (~~Scheer~~) " " " ~~30–36: cent 6: 12~~
12–36 ; 3–12
M. ~~dasyacantha~~ n. sp. lente sulcat, axillis sub villosis A. 25–35 : 7 : 14
M. tuberculosa profunde sulc. axill villos. 20–30 : 3 : 9
M. Pottsii cylindr. levissime sulc. ax. sub villi rigid ∞ : 7

All have ~~the radial spines white, often~~ straight mostly stiff spines, the larger ones mostly tipped with darker purplish or brown or black; ~~ee~~ radial spines white, often tipped dark; fewer and stiffer & shorter below, more numerous, crowded, weaker, longer & often with a number of very weak & short ones above; Central spines darker, stouter, longer, from 1 to 3 to 12 or 14, one mostly deflexed, stouter and rather shorter than the balance; Those ~~directed upward the longest~~, central spines mostly light at base and ~~darker~~ red, purple, brown, bluish purple upwards, at tip purplish black.

32 ~~Specimens examined~~ in most of them

flowers purple or rose, sepals arachnoid fimbriate, petals entire, all linear or linear-lanceolate; fruit oval, green crowned with the flower — seed obovate (oblanceolate or more globose) fulvous, fuscous or almost blackish — scrobiculate.

Specimens on the last pages described, arranged.

Mamillaria radiosa ~~β~~ borealis	No 1	tub. 6-9'''	sp. 18-20 : 4-5	
	2.	6'''	20 : 5	
β novomexicana	3.	— 4'''	30-35 : 6-8	
	4	— 3½'''	20-24 : 3-4	
	5	3-4½'''	20-21 : 4	
	7	6'''	30. : 6-8	
	12	5-6'''	30-36 : 6-9	
	13	6'''	34-35 : 8-12	
	14	6	23 : 4-6	sem 0'''.6 fusc
	15	——	33 : 10-12	
	17	——	26-30 : 4-6	„ 0'''.8 fusc
	26	——	40 : 3	
	27	3	22-25 : 6-7	„ 0'''.8 fulv
	28	——	23-26 : 2	
Mam. dasyacantha vera	11	4	26 : 7-9	„ 0'''.6 nigr
microsperma	16	3-3½	22-25 : 5-7	„ 0'''.4 nigr
dubia (near novomexicana	8	5	25-30 : 7-8	
	9		30-35 : 8	
~~[illegible]~~	10		32-35 : 12-14	
Mam tuberculosa	6	2'''	16-19 : 1-3	
	18.	2½	30 : 3-4	
	19	3-4	20-23 : 5	
	20	4-5	25-28 : 5-8	
	21	2½-3	22-24 : 7	
	22	3-4	25 : 6	
	25	1½	18-20 : 4	
	29.	3	28-30 : 6-8	
	31	2½	25-28 : 8-9	. 0'''.4 fusc
	32		26 : 8-9	
conica	30	2½	25-26 : 9	
dubia ?	23	4	23 : 3	
" ?	24	2	27 : 3	

~~The nearly related Mammillariae are the following~~

Mam. arachnoideae

Mam. radiosa simplex s. ~~e basi parce ramosa~~ ad basin parce prolifera ovata s. ovato-cylindrica; tuberculis laxis, patulis teretibus supra sulco ~~levi~~ breviore s. ~~brevissimo~~ novello villosulo, saepe indistincto notatis; × areolis orbiculatis ~~novellis~~ albo-tomentosis; aculeis rectis rigidis ~~numerosis~~; exterioribus patentissime radiantibus ~~albidis~~ apice saepe sphacelatis, inferne rigidioribus superne longioribus tenuioribus cum brevissimis adventitiis additis numero valde inaequalibus (12–36); interioribus robustioribus, longioribus, plus minus purpureis fuscatisve (3–12) plurimis sursum versis, longioribus, singulo deflexo, breviore robustiore; floribus ~~ex axillis~~ subverticillatis (nec rite centralibus); sepalis arachnoideo-fimbriatis et petalis integriusculis linearilanceolatis acuminatis saepe aristatis; stylo stamina ~~longe exserto~~ superante, stigmatibus ~~purpureis~~ suberectis, obtusis 5–9; bacca oblonga viridi, ~~floris~~ rudimento coronata, seminibus fulvis, fuscisve obovato-elongatis compressis scrobiculato-punctatis.

× axillis nudis s. junioribus nudiusculis

α. **Texana** ovato-cylindrica ~~tuberculis~~ aculeis radialibus 20–30 albis, apice adustis, centralibus 4–5 flavis s. fuscatis; floribus majoribus sepalis 20–50, ~~petalis~~ 30–40 stylo stamina ~~superante~~ sem. majoribus fulvis (~~longe superante~~ Plant. Lindh. in Boston Journ. Nat. Hist. VI. p. 196

β. **borealis** (ovata), s. subglobosa, aculeis radialibus 12–20, centralibus 3–6 e basi purpureo-fuscis s. saepe medio albi-maculatis; floribus minoribus, sepalis 25 petalis 30, stylo stamina paullo superante seminibus minoribus fulvis. (~~M. vivipara var~~ Plant Fendl. in Mem. Am. Acad. pag 49 ~~Wislig.~~ Rept. pag 75 & 74. —

(Wislig. Mem. ~~[illegible]~~ 6)

3514

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Cactaceae No. 34 | 1853

7. Living plant 1852 3½" high 2" diameter, prolifers at base, with 7 young shoots. a, main plant; tubercles 6‴ long grooved almost to base; groove in young ones tomentose, especially at bottom, but axillae naked; 30 rad. spines, upper longer, stouter 6-8‴ long undermixed with weaker ones, lower gradually shorter, lowest only 3‴ long; lower white, upper ~~often~~ tipped with brown; Central spines 6-8 upper longest 8-9‴ lower 5-6‴; all at base white, reddish in the middle and blackish brown at tip. — b. Branches from the middle of a tubercle (lower end of sulcus?) only at base of plant. ovate 10‴ in diameter; tubercles 2½-3 l. long, no groove perceptible radial spines 22-28, more equal 2-3‴ long, central none or 1-4 (one deflexed) a little longer. — Tubercles in all in 13 rows, old & young on the lowest part of the old plant (~~tubercles~~ scars of old tubercles) 21 rows

8. Liv. pl. 1852. simple 2½" high, 2" diam. Tuber 5‴ long grooved to the axilla which remains woolly for a long time — finally glabrous 25-30 radial sp white; upper stouter longer 6-7‴ with brown tip; lower white, 3‴ short; 7-8 central spines in a circle, upper longer 10-11‴; lower shorter 6‴; all loosely radiating; longer than the correspond. exterior spines, all below white, with purple in middle and dark purplish brown on tip. — About 13 rows — scars at base in 21 rows — Appearance like Echin. dasyacanthus (purpureo-caesius!)

9 liv. pl. 1852 simple 2" high, very similar to 8 – but grooves less distinct and axillae more naked; spines a little shorter, longest central only 8‴ — radial 30-35 central 8.

10. dead, Eagle spring 1851. 2" high, oval; similar to 8 & 9 radial spines white bristles, upper ones much longer, with light brown tips; 32-35, upper 7-9‴ lower 4-5‴; ~~central~~ inner spines 12-14 longer than the outer, upper 9-12‴ longer than the lower, 6-9‴ all loosely patulous, the exterior almost radiating, one central 6-10‴ ~~erect~~ in the centre of the areole, (not deflexed. Inner spines purplish brown whitish at base dark at tip

10. b. dead 1858 oval simple 2½" high; tub. 5-7‴ long 13 rows – 25-28 rad sp – 6-9 central 6-10‴ long sulcus to base axilla villous

11 dead. 1851 ~~ovate~~ globose, simple 2¾" high; tubercles about 4‴ (shrivelled) upper ones ~~with a~~ woolly groove; about 26 radial spines; fewer below 3-4‴; above the longer and the smallest crowded together, 3‴-6‴ most all with purplish brown tips. Inner spines 7-9 purple almost to base, very dark towards the tip, 6-8‴ one more central

over

134 On this specimen a central fruit was found, oval, crowned by the remains of the flower. These indicate ciliate fringed sepals; the fruit is oval, only 3½''' long; the remains of the flower about the same length; — but both may have been shrivelled. The fruit is full of ripe seed, which differs from that of the related plants.

a. M. radiosa : sem. ovato-oblanceolata, compressa scrobiculata
1.0 l. longa fulva
b. M. Santa Fe. sem. ovato-oblanceolata compressa, scrobiculata
0.7 l. longa fulva
c. M No. 11. sem globoso-obovata triangulata, scrobiculata
0.6 l. long atrofusca

a & b are equal, but b much smaller; c. is shorter even than ~~b~~, but much thicker; convex on the back, sides flat, forming ▽ a cross section

12. live pl. 1852 large specim with 4 larger and 2 or 3 smaller heads; heads oval 2-3'' high, 1¾ - 2½ in diameter. Tubercles 5-6''' long, sulcate to the base; rad. spines 30-36, lower much stouter 3-4''' upper unequal, but mostly longer, 5-9'''; ~~central~~ inner sp. 6-9 stouter, principally the uppermost longest, 7-10''' only the largest spines with brown tips, internal & external

A young branch has tuber 3 l. long, 30-35 short, thin, white spines, 2-3''' long

13 dead pl. 1852 simple, 4'' high 2'' diameter; tubercles sulcate to base; 24-35 very weak radial spines 3-5''' long, more crowded but not mainly longer at the upper end; inner spines 12 in a circle, spreading 4-9''' long and 2-3 internal, central 5-8''' long even the lowest dead spines of this plant show the same arrangement. — There are 2 other specimens almost exactly alike; rad sp 3-6'''; 8-10 inner spines, 5-8'''; the 2 innermost a little darker at tip; the longer directed upward, the shorter one downward. One of these specimens had 4 vertical flowers; shriveled up, and in that state only 7 or 8 l. long; about 16 linear-lanceolate mucronate + hairy-fimbriate sepals, and 20 linear denticulate-fimbriate petals.

14 dead pl. 1852. oval, only 1¼ inch high; 5 fruits, vertical, not ripe, shrivelled; only 6''' long oval; fl. on top a little longer, with very much hairy fimbriate sepals; seeds obovate, little compressed, rounded, fuscous (not fulvous) scrobiculate; a little more than 0.6''' long; same size as seeds of Fendler's Santa Fe specimen, but somewhat less compressed, with larger pitted dots, and much darker colour.

Tubercles, (upper ones) 6''' long, with tomentose groove to the to the base, where the floriferous axilla woolly. — 23 rad. spines, 4-8''' the longest and some of the weakest and stoutest, above; fewer and shorter ones below; central spines 4, 3 upward, 1 downward or erect; 6-8'''. — A little lower the tubercles are shorter 3''', with the same number of rad. sp. more equal, and 4-6 radiating inner spines, a little longer than the ~~central~~ external sp. all 3-5''' long. Lower down yet on the plant 22-26 rad. sp 2-3'''; 2-5 inner, all radiating, 3-4''' long, longest downward

15. dead specimen, only spines; 1851? 33 rad. sp.; upper longest 3-8''' 10-12 inner stouter; ~~upper~~ uppermost longest 5-10'''; 1 central, ~~or~~ erect, or directed upward. — lower tubercles with 25-28 exterior 3-5''' and 5-7 interior stouter, longer spines radiating 5-7'''

16. live pl. 1852 globose simple 1/2'' in diameter; tubercles 3-3 1/2''' long, grooved to base; spines soft hairlike; 22-25 exterior sp 3-5'''; longest upward; 5-6 interior, 4-8'''; longest upward, over half of them dark purplish brown, exterior sp. all tipped with brown. Shrivelled flowers 5''' long, with fimbriate sepals; shrivelled fruit only 2''' long; seed, black, ovate-globose not triangled; in colour similar to 11, but much smaller only 0.4''' or 0.4 1/2''' in its longest dimension; about the size of seed of M. tuberculosa but almost black, ~~[illegible]~~ [illegible].

17. dead plant, San Pedro 1851 simple, oval; 26-30 rad sp. 3-6''' 4-6 central, 3-5 upper 6-8'''; 1 erect 6''' long; seed brown [illegible] 0.8''' long exactly like that of No. 14 but a little longer.

18. dead 1852 small simple globose 1 inch diameter tubercles 2 1/2''' oblong oval deeply grooved; axilla very woolly; 30 radial 3-6''' 3:1 central sp. 4-7'''; 2 or 3 upper ones radiating, longest, lower one erect or a little deflexed.

19. dying, 1852 simple, oval 1 3/4'' high; tub. about 4''' cylindric strongly sulcate, axilla even on the older ones very villous; 20-23 rad sp stiff; 3-5''' long; 3:1 central red, purple brown above, 3-6''' sepals fimbriate

20 dead 1851. cylindric, branched at top 3'' high 1/2 diameter; tubercles in 13-21 rows; oval, adpressed, sulcate to base with very woolly axilla 4-5''' long 25-28 rad sp mostly coloured at tip 2-4''' longest & weakest above; 5-6-8 inner, longer above, all radiating, 3-6''' or one central, directed upward; all inner spines purplish, pale at base, dark at tip. On younger branches 16 subequal radial spines 2''' weak; 2 central; a longer upward 3 1/2''' and a shorter downward 2'''

3515

This like the last and apparently all the specimens of this species remarkable for the hard compact structure of the plant, so that even in drying the tubercles retain their shape.

21. dead 1851. Pecos & Ojo de Leon on stony hills common. Several oval heads from one base, each 1¼ or 1½ inch long tubercles hard ligneous sulcate, groove in the young very woolly, axills woolly; tubercles 2½-3'''. 22-24 rad. spines almost equal 2½-3''', a few very weak & short upwards; 4 stouter and upward 2 or 3 weaker inner spines (the latter might perhaps better be taken for exterior -6''') the longer 4-5''' upward one short but stout downwards 3''' long; — better 25-27 rad & 4 central one of which downward; — rad white, longest with brown tips; central whitish at base purple & brown above. — Younger tub. with 2-3 central spines; the longest allways upwards

22. dead 1852 Many (6-8) oval heads — each 1¼-1½ inch high — Oldest tubercles still deeply sulcate, about 4''' long and at base almost of same diameter, somewhat compressed, retaining their shape entirely in 13-21 rows. Tub. 3''' sulcate axills very woolly — spines radial 25, 2½-3½''' upper a little longer but rather weaker than lower ones, and some short and very weak. Central spines 6 stouter, and 3 upper ones weaker, almost corresponding with the radial sp; 4-5'''

23 dead 1851 Pecos. oval simple 1'' high; tubercles 4''' 23 radial, white with brown tip; 3 central, 2 upward, 1 downward, purple tips

24 dead 1851 6 young shoots on an old stump, each globose 6'' high; tubercles 2'''; spines all radial, about 30; in others 3 central spines are distinguishable, radiating, 2 upper and 1 lower shorter one

no wool in the axills

25, dead 1852. 2 plants each with 2 heads ½-1'' high, oval; tuberc. 1-1½''' long sulcate; central purplish spines sticking up upright; 12-20 radial 2-3''' 3:1 central, 2½-3½ l. long.

26 live pl. 1852 simple, oval, 1¾'' high 1'' diameter; tubercles 21 rows below close, with short rad spines ~~no central~~ about 40; 2''' long, & 3 inner a little stouter, all white; — upper tubercles 2½''' long, slightly sulcate, naked axills 35 rad sp 2-4''' 7 central radiating spines 3-5''' long, reddish, darker at tip

27 live pl. 1852 simple, oval 1¼'' high with one somewhat lateral fruit; tubercles 3''' long slightly sulcate 13 rows axills naked; rad sp 22-25 2-5''' long, white, some with brown tips; inner sp 6-7 radiating

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Cactacea 36 1853

β novo-mexicana ovata s. ovato-subcylindrica aculeis radialibus 20-36 (~~[illegible]~~ plerumque sub 30) centralibus 3-12 (plerumque 6-9) basi albidis ~~versus apicem~~ supra plerumque purpureo-rutilis, versus apicem fuscatis; floribus majoribus seminibus minoribus fulvis, fuscisve.

Var α has been found by Lindheimer in sterile sandy soil on the Piedernales River (confluent of the Guadaloupe in Western Texas; β. has been ~~[illegible]~~ coll abundantly by Mr Wright in all his expeditions in southern New Mexico and between El Paso and San Pedro River; γ was found by Wislizenus from the Waggon mound westward to Santa Fe, and by Fendler from Bents Fort to Santa Fe, and also near El Paso by Wright. — A very variable plant the different forms of which are often so unlike one another and approach so near to other species that it is difficult to class them correctly. They differ very much in the number & size of spines, size ~~[illegible]~~, of flower and of seed, but transition forms appear to connect ~~[illegible]~~ the extremes. ~~In the~~ All are simple or ramose from the lower part of the stem or the subterranean stem, never proliferous in the manner of M. vivipara & similar. In all the tubercles are ~~loosely~~ arranged almost ~~[illegible]~~ in 13 rows the groove incomplete, not extending to the base, often ~~indistinct~~ very short or indistinct; spines rigid; fruit juicy about 3/4 inch long; seeds elongated and much compressed ~~[illegible]~~ 1/2-1 line long.

Var Texana is 2-4 inches high—1½-2 in diameter, tubercles 4-6 lin. long in 13 rows, exterior spines 3-4, interior 4-6 l. long, coloured from the base but darker ~~above~~, mostly purplish brown &; fls 1½-2½ inches ~~in diameter~~ long &; seed fully 1 line long — Var novomexicana I have seen from ~~1½ or~~ 2 to 4 inches high — ~~tubercles~~ 1-2½ in diameter; tubercles from 3-6 ~~[illegible]~~ lin. long; ~~exterior~~ spines very variable in length and number, in smaller specimens the exterior are 2-4 and the interior 3-6 l. long; in larger ones the former are often 3-8 and the latter 5-10 l. long. The interior spines are often white ~~and only~~ with dark brown tips, but mostly white at base, purple in the middle and purplish ~~black~~ at tip. — Flowers not seen; seeds 0,6-0,8 l. long. The ~~smaller seeds~~ and larger number of stouter and longer spines & smaller seeds distinguish this from the texan form. —

142.

Var. borealis is ~~almost globose~~ the northern form and approaches somewhat to M. vivipara in the mostly smaller size ~~of~~ the plant and the smaller number of spines — but the spines are much stouter, the ~~heads~~ tubercles not ~~viviparous~~ proliferous, flowers much smaller etc. — ~~specimens~~ ovate or mostly globose, 1–2½ inches in diameter tubercles 4–6 ~~or 7~~ l. long; ~~rad~~ exterior spines 3–7 lines ~~central~~ interior 5–9 l. long; the latter purple from the base, often variegated with white, often with lighter tips; flowers only 10–12 lines long, seeds about 0,6 l. long fulvous. —

Mammillaria dasyacantha n. sp. simplex

ovato subglobosa. tuberculis laxis, cylindricis ~~leviter~~ usque ad basin sulcatis, axillis subvillosis, demum nudatis, areolis orbiculatis, novellis albotomentosis aculeis rectis ~~setaceis~~ √ tenuibus; numerosis; exterioribus patulis 22–26 25–35, ~~capillaceis~~, albis, apice sphacelatis, interioribus 7–13 patulis exteriores superantibus, ~~flava~~ albidis s. purpureis super ~~e caesio~~ caesio-purpur. s. — purpureis fuscis, apice atris ~~atropurpureis~~ centrali singulo aequilongo porrecto saepe deficiente; flor~~ibus~~um parv~~orum~~ sepalis ~~exterioribus~~ arachnoideo-fimbriatis; baccis ovatis parvulis, seminibus obovato globosis scrobiculatis, nigricantibus.

Several specimens were collected 1851 & 1852 near El Paso and at Eaglespring. 1½–2½ inches high a little less in diam. tubercles in 13 rows, 4–5 l. long; groove

extending to the base, hairy when young, often very slight. ~~Lowest end of groove~~ axillae more or less villous, ~~with~~ becoming naked with age, or often very soon. ~~Exterior sp~~ Spines mostly not as rigidly radiating, more loosely spreading (exterior as well as interior ones); much more slender than in the other 2 species, often capillary, and softer — Exterior spi

3-6 or even 9 l. long: inner spines in a circle
corresponding with the outer ones, but darker &
longer; upper 8-12 lower 6-9 l. long, or in some
specimens shorter and slenderer. Central spine erect
8-10 l. long or wanting purple from base or middle
darker at top. ~~Central~~ Fruit central in a tomentose vertex
(dried ~~&~~ ~~dry~~ shrivelled only 3/2 l. long) seeds
subglobose or somewhat triangular, in one specimen 0.6 in
another 0.4 fewer (22-25) l. long black! — The specimen with the small seeds, is only
1½ inch high, with shorter and weaker spines. Other specimens with stouter and longer spines, the exterior more radiating, but unfortunately without fruit somewhat approach to some forms of M. radiosa but this species appears always
+ well distinguished by its shape ~~and~~ principally
the soft weak spines, the inner ~~dark~~ purplish brown radiating like
the outer, central spine often present long
and erect, not deflexed & black seed. —

Mamillaria tuberculosa n. sp. see pag 213

ovata s. ovato-cylindrica, simplex s. ~~plerumque~~ saepe
a basi ~~(parce versus apicem)~~ ~~parce~~ prolifera, tuberculis e basi rhomboidea
ovatis (sub conicis), abbreviatis obtusis subcompressis (demum suberosis persistentibus) ~~demum indurat~~ ~~papillis~~ inferiore parte ~~tubercul~~
erectopatulis, profunde sulcatis usque ad basin, ~~[illegible]~~ primum, axillis villosissimis restantibus stipantibus
areolis orbiculatis novellis albotomentosis;
aculeis ~~radialibus~~ exterioribus 20-30 rigidis ~~rite radiantibus~~;
albis ~~subinde~~ apice sphacelatis, ~~centralibus~~
rite radiantibus; interioribus ium 5-9 longioribus um
supra medio purpureis orum apice ~~atratis~~, sphacelatorum
superioribus longioribus, erectis ~~[illegible]~~ versus plantae
apicem ~~connivent~~ simulantibus, infimo breviore robustiore
porrecto s. plerumque deflexo; floribus parvis, ‡ in vertice densissime lanoso enatis 16-18'' sepalis lanceolatis ‡ see pag 213
arachnoideo-fimbriatis, petalis 10-13 lanceolatis
subintegris dilute roseis ~~purpureis albescentibus~~;
~~Floris parvis~~ seminibus subgloboso-obovatis, but see pag 213
(fulvis s. fuscis) scrobiculatis minimis.

From the Pecos to Ojo de Leon, Eagle spring
and El Paso, on the higher mountains; coll
1849, 51 & 52, ~~fl.~~ Stems 2-5 in high - 1-1½ diameter;
tubercles generally about 3 lin long, often shorter
rarely in very vigorous plants as long as 4 or even 5 l. ~~longer~~; in 13 or below in
21 rows, like the whole ~~body~~ of the plant of
a spongy or rather corky texture, almost dry,

3516

and therefore ~~not~~ shrivelling in drying. Older tubercles loose their spines ~~but~~ remain persistent on the lower part of the plant, retaining their shape, ~~oth~~hence it appears covered by tubercles. ~~Spread~~ Radial spines generally 22–26, rarely less than 20 and never more than 30 in the numerous specimens examined by me. – Radial spines thin, but stiff, mostly 2–4 (lowest and a few upper 2, upper 3–4) lines long; ~~[illegible] spines mostly rarely~~ uppermost rarely 5 or even 6 l. long; central spines lower 3–4 upper 5–7 and in a few specimens even 8 or 9 l. long; those of the uppermost tubercles crowded together, erect, forming a gray-purplish tuft which together with the cylindric growth and the tuberculated appearance of the lower part of the plant readily characterize this species. It is +

A species recently sent to Europe from Chihuahua, and described ~~[illegible]~~ under the name of M. Pottsii by Mr Scheer (Salm Cact. 1850 pag 104) appears to come very near to our species+, but is distinguished by its ~~very slightly grooved" tubercles and [illegible]~~ "tubercles being "supra levissime sulcatis" ~~and~~ axillis "sublanuginosis". – Mam. strobiliformis Scheer l.c. apparently from the same region is also cylindric, with ~~ovate~~ conic slightly sulcate tubercles, almost naked axills; 20–25 yellowish brown radial and 1–4 central spines of the same colour. – M. sphacelata Mart & M. conoidea DC also appear nearly related forms – but have only 12–18 rad. spines and the flowers of none of those must appear to be described, nor their seeds, so

+ further distinguished from all the ~~closely~~ related species by ~~the~~ deep woolly groove ~~on the [illegible]~~ tubercles and the very woolly axillae which only after several years ~~become~~ naked

it is cylindric 6 inches high & has ovate tubercles,

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~~that it~~ remains doubtful whether they belong to one section of Anhalonideae of which I know now only the 3 species here described and M. vivipara. —

Mam. macromeris E. Wisl. Rep. note 15.

Char. emendat.: simplex s. ~~e basi~~ parce ramosa proliferaque, s. cylindracea, laete viridis ovata; tuberculis (laxis s. rarius plus minus imbricatis) e basi dilatata ~~elongatis~~, teretibus, incurvis, magnis patulis, ~~ad medium ultrave sulc~~ supra sulco tenui (~~juniore villoso~~, demum nudo) ad medium ultrave ~~producto et~~ usque ad areolam tomentosam floriferam supraaxillarem producto ~~terminato~~ notatis; axillis nudis; areolis junioribus albotomentosis; aculeis tenuibus elongatis, teretibus s. robustioribus demum angulatis compressisve, rectis s. paulo curvatis; exterioribus ~~12 sub~~ 12 (rarius 13-~~15~~-17) ~~laxe patentibus albidis~~, albidis s. junioribus subinde rubellis, apice sphacelatis, inferioribus saepe paulo brevioribus; centralibus sub 4 (in plantis ~~novellis~~ junioribus saepe 1-3) longioribus, basi bulbosis, plerumque nigricantibus ~~subinde~~ raro roseis fuscisve; floribus ex ~~[illegible]~~ imo sulco tuberculi ortis maximis, e carneo purpureis, ovario exserto ~~[illegible]~~ squamis paucis ciliatis instructo, sepalis 20-30 lanceolatis, inferioribus ciliato-fimbriatis, superioribus integriusculis, petalis 20-25 oblongo lanceolatis, versus apicem denticulato-ciliatis, mucronatis, stylo supra stamina longe exserto, stigmatibus 7-8; bacca globosa, floris rudimento coronata, viridi, seminibus fuscis ovato-globosis, laevibus.

In the Valley of the Rio Grande from Doñana (~~Wislizenus~~ 1846) down to El Paso and below to the Cañon, in loose sand mostly on hillocks confined by the Roots of Algarobia; also east as far as the Pecos (Wright) fl. July & Aug. fr. — A splendid species 2-4 inches high. Tubercles ~~[illegible]~~ loose or sometimes more crowded in 8 rows, very different in size, from 6 or 7 to 10 or 12 l. long, sometimes even 15, 4 l. wide at base. Radial spines from 6-20 l. long.

grey or all or only the upper when quite young rose coloured; central spines mostly in 4 ~~the lowest strong~~ 1–2¼ inches long, the lowest longer and stouter than the rest. — Mostly black but in some species pale reddish or brown, tipped with black — straight or somewhat curved or twisted. In young plants the 10 radial spines are 3–6 l. and the single central 6–12 l. long. Axillae always naked and flowers springing from the lower villous end of the ~~tubercular~~ groove, in the middle or lower third of the tubercle; 2½–3 inches long and of the same diameter, rose coloured (Bigelow) or carmine verging to purple (Wright) darker red in the center and toward the top. Among Mr Wright's specimens I find an unripe fruit, globose, with the long flower yet remaining on top, seeds (not fully formed) yellowish brown apparently smooth. —

Bigelow
Among Mr Wright's specimens a fruit was found, globose 6–7 l. in diameter, topped with part of the dried flower and differing so far as known from all other Mammillariae by ~~having~~ being coated with 5 sepaloid triangular ciliate scales, thereby differing from the character of the Genus and approaching Echinocactus, from which it differs so widely in every other respects
seeds 0.6–0.7 l. long

Mammillaria Scheerii Muehlenpf.
Salm Cact. 1850 pag. 133

β. ~~Wrightii~~ valida — vide pag 99

M. Scheerii is distinguished ~~according~~ to Prince Salm's description from our plant by the shorter and fewer (8–11) radial spines and the single "much longer (1 inch long)" central spine; it is globose, 3–4 inches in diameter, ~~flowers~~ of the same size as ours, ~~sepals~~ with apparently entire (?) sepals, — and red streaked yellow petals. The areolae are described as naked; while in our plant we find the young ones very thickly covered with long wool, which disappears by age. Nevertheless I consider ours only as a northern form of the Chihuahua species, with more numerous and stouter spines which ~~appearance~~ character very often distinguishes

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northern from Southern forms (~~see also~~ compare eg. Echinocactus flexispinus) E. setispinus etc. —

Mammillaria hemisphaerica Engelm. in Pl. Lindh. II Boston Journ. VI pag 198. The numerous specimens are from 2–5 inches in diameter, from a turbinate caudex hemispherical or sometimes more or less flattened; tubercles 5–7 l. long; with 9 or 10 or in other specimens 10–14 radiating spines from 2 to 3 or in some even 5 lines in length, the lower a little longer and stouter; central spine ~~very~~ stout short 1 l. long or sometimes as long as 3 or 4 l. All whitish or the lower and the central spine darker, toward the ends. — As there are no fruits on these plants the seeds which well distinguish M hemisphaerica & ~~M~~ applanata can not be compared, and we must rely on the small number of spines to identify the plant. Found on stony hills ~~from~~ at El Paso ~~east~~ and eastward

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M applanata E. in Pl. Lindh. II in Boston Journ. VI. p. 198 Char. emend. Simplex depresso-glo hemisphaerica, tuberculis elongato pyramidatis subquadrangulatis, axillis nudis s. parcissime pilosis, areolis junioribus plus minus ~~albo~~ tomentosis, aculeis rectis, radialibus exterioribus 11–20 inaequalibus, inferioribus robustioribus longioribus, (singulo) centrali robusto ~~erecto~~ abbreviato; floribus sordide albidis s. rubellis, ovario glabro s. basi ~~parce~~ piloso; sepalis 8–13 lanceolatis acutis vel obtusiusculis, petalis 12–18 ~~oblongo~~ lanceolatis, mucronatis integris s. interioribus versus apicem denticulatis; stigmatibus 5–8 flavido-rubellis stamina brevia flavida s. rubella excedentibus; baccis elongato clavatis, seminibus parvis ovatis, rugulosis.

α. vera ~~tuberculis~~ ~~tota planta~~ vel ~~centro plerumque~~ depresso plerumque, caule applanato, areolis junioribus dense lanosis, aculeis numerosioribus (15–20) seminibus majoribus subglobosis M. appl. E. l. c.

β. hemisphaerica caule hemisphaerico. areolis junioribus parce tomentosis, aculeis paucioribus (9–12) seminibus minutis oblongo obovatis, M. hem. E. l. c.

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3517

flavis s. carneo rubellis

Mamillaria meiacantha vide pag 88 & 103. — lactiflua, simplex, hemisphaerica s. vertice depressa; axillis nudis; tuberculis quadrangulato-pyramidatis compressis, basi productis, areolis junioribus albido ~~tomentosis~~ villosis, ~~[illegible]~~ mox nudatis; aculeis paucis (5-9) rigidis, rectis s. recurvatis albidis (demum cinereis) ~~apice~~ sphacelatis: centrali (singulo erecto s. sursum-flexo cum ceteris radiante) omnibus ~~radiantibus~~, inferioribus paulo longioribus ~~s. summo erecto aculeum centralem instar erecto~~; floribus see p. 88

baccis … seminibus fuscis ovato globosis, rugosis

New Mexico, brought home by the Missouri volunteers, 1847; in valleys between the San Pedro and Pecos Rivers Wright 1851 and on stony hills from ~~the~~ El Paso eastward to the Pecos 1852; — Very nearly allied to M. applanata, but distinguished by the fewer and much stouter often curved spines. Specimens before me ~~[illegible]~~ 3-5 inches in diameter; tubercles in 13 or 21 rows; 8-9 l. long, strongly quadrangular, somewhat compressed from above; ~~basi producta~~ 7-9''' long. Spines fewer (whence the name) than in its relatives and stouter; 5-9, but mostly 6, — lowest ~~[illegible]~~ mostly a little longer than the lateral ~~spines upper stout and short, often there is no central spine, but absent whenever this is present~~; ~~one apparently~~ occasionally ~~taking the place of the other — spines~~

Central spine short, stout, erect, or often turned upwards and taking the place of the always absent upper ~~radial~~ spines, ~~radiating with~~ ~~flowering~~ spines 3-5''' long; Flowers see pag. 88. Fruit pag 103.

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Cact. 38. see pag 159. 1853

Mam. calcarata on fertile soil
in the valley of the Nueces —
not distinguishable from the specimens collected
on the Colorado and Guadalupe in Texas,
Proliferous and often cespitose, rarely single
heads; radial spines 8–10, (4–6 l. long straight)
central spine stouter, recurved, ~~a little longer~~,
of the same length; often wanting; all white
and mostly with dark tips. — In some cultivated specimens I find 2 central spines and in one of them 3 to 4, straighter and weaker. —

The texan form has 10–12 radial spines 4–7 or the upper ones smaller 8 or 9 l. long; central spine bulbous at base stout, curved downward, 5 or 6 l. long, or wanting; sometimes a second central spine is present above the first and directed upward

Mammillariae.

I Chlorocarpae bacca oblonga, viridi; coronata seminibus testa pergamentacea fulva s. fusca, rarius nigrescente

see below

1. Seminibus laevibus
a. Aculeis omnibus radiantibus tuberculis abbreviatis
Mam §.6. Centrispinae
3. M. compacta
4. M. pectinata
b. aculeo centrali singulo, tuberculis ovato-cylindraceis
Mam §.11. Aulacothelae
6. M. calcarata
5. M. Echinus " "
2. Seminibus scrobiculatis
a. aculeis ~~rectis~~, centralibus pluribus rectis (arachnoideae
(Mam §.6. Centrispinae in parte
7. M. vivipara
8. M. radiosa α texana β. novomexicana γ. borealis "
9. M. tuberculosa "
10. M. dasyacantha "
b. aculeis centralibus singulis brevive hamatis (Mam. §2. Crinitae Salm.
11. M. barbata
12. M. Grahami
13. M. diancistra
3. dubiae sedis ~~II Erythrocarpae~~
1. ~~12~~. M. macromeris fructu elongato, sem. fulvis s. fuscis testa pergamentacea
2? ~~13~~ M. Scheerii var Wrightii

these two must come at the head No 1 & 2 sem. laev. tuberculis ~~bacca~~ longa cylindraceis elongatis; aculeis
Mam §.11. Aulacothelae

II. Erythrocarpae see next page

II Erythrocarpae, bacca nuda

1. bacca clavata sem. fuscis fulvis ve lactescentes

14. M. gummifera — Mam § 6. Centrispinae i part
15. M. applanata
16. M. hemisphaerica
17. M. meiacantha

2. bacca clavata, sem nigris, duris

18. M. lasiacantha — Mam § 3. Polyacantha
19. M. micromeris — "
20. M. tetrancistra — Mam § 2 ~~Polyacanthae~~ Setosae Heterochlorae

3. bacca globosa, sem nigris duris

21. M. similis β. robustior — Mam §. 6. Centrispinae i part
22. M. Nuttallii — " "

dubiae sedis

23 M. papyracantha.

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on the 14th of Dec 1852 I sent Manuscript to Dr Gray with the following contents:

Geographical introduction

Mamillaria

§ 1. Chlorocarpeae

† bacca squamata

1. M. macromeris E.
2. ? M. Scheerii Muhl β. Wrightii

†† bacca oblonga nuda

* sem. laevibus

a. tuberculis abbreviatis, aculeis radiatis

3. M. pectinata n.sp.
β. cornuta

b. tuberculis cylindraceis, aculeo centrali singulo

4. M. Echinus n.sp
5. M Calcarata

** sem. scrobiculatis

a. aculeis centralibus pluribus rectis

6. M. radiosa E. & Texana
β. Novomexicana
γ. borealis

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7. M. tuberculosa n. sp.
8. M. dasyacantha n sp

c. aculeis centralibus uncinatis

9. M. Grahami n sp
10 M. diancistra n sp

§. 2. Erythrocarpae

† bacca clavata, succo lacteo sem fusc.

11. M. applanata E. α vera
β. hemisphaerica
12. M. meiacantha n sp

†† bacca clavata, succ. aqueo, sem nigri

13. M. lasiacantha n. sp. α. minor
β. denudata
14. M. micromeris n sp

††† bacca subglobosa, sem. nigr.

15. M. similis

Echinocactus

§1. Polyacanthi

1. E. dasyacanthus n sp
2. E. intertextus n sp

§. 2. Hamati

* genuini

3. E. setispinus E.
4. E. Wrightii n sp
5. E. flexispinus E α crassispinus
β. gracilispinus
γ. brevispinus
δ? leucancistrus
6. E. brevihamatus n sp
7 E. uncinatus Hopf

** ingentes

8. E. Wislizeni E.

§. 3. Corniferi

9. E Texensis Hopf
10. E. laticostatus n sp
11 E. albispinus n sp.

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~~crenatum~~ verrucosum

Anhalonium? found by Drs Parry & Bigelow and Mr A Schott in Sept 1852 near the Rio Grande, not far from the mouth of the Pecos, on hard gravelly limestone hills near Fairy springs, ~~and also~~ between Devils river & Pecos; Cañon of the Rio Grande (Parry)

flow in October (second fl?)

3518

Stem hemispherical or globose, rarely above the surface, lower part top shaped: 2–4½ inches in Diameter; Tubercles (12–25 Bigelow) projecting almost horizontally, at base somewhat triangular, obtusely carinate on the outer lower surface, upper surface with several (3 Bigelow) longitudinal grooves, which are irregularly transversely cleft (rugoso-tuberculatis); margin also irregularly fissured

larger tubercles 9 l. long

Areola oblanceolate (Big) & fissured (Parry) & hairy (B), bedded with long woolly fibres (Parry), formed by a cleft of the two inner lobes (Big)

flower pink or rosecoulered exterior sepals whitish fleshy. — abt 1 inch long and in diameter long

Ovary 3 l. long 2 l. wide central (immersed

surrounded by long silky wool;

~~tube 4–6 l. long~~ lower sepals 12, whitish lower ones linear lanceolate, upper ones spathulate ~~entire~~; upper sepals 8 rosecoloured, spathulate, mucronate, 6–9 l. long 2 l. wide; petals linear spathulate ~~9 l.~~ 9 l. long 2 l. wide rose, somewhat lacerate.

in wool

Stamens numerous, white, anthers orange, Stigmata exserted, but shorter than petals, erect spreading, funnelshaped — 5–10 parted, light yellow

fruit oval? crowned with the flower

seed black

Axillae?

Grooves hairy?

fruit? immersed?

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